

WHAT IS CLAIMED IS:

1. A flow control device comprising:
 - a wall part partitioning an upstream side and a downstream side of a flow passage for fluid;
 - an aperture part formed on the wall part;
 - a sheet shaped valve element which changes from closed state in which the sheet shaped valve element extends along the wall part to cover the aperture part to an open state in which the aperture part is opened; and
 - a valve element drive mechanism for moving the sheet shaped valve element.
2. The flow control device according to claim 1, wherein the valve element drive mechanism adjusts an opening degree of the aperture part by the sheet shaped valve element.
3. The flow control device according to claim 1, further comprising a rolling element body provided in the valve element drive mechanism that performs a rolling motion along a wall face of the wall part,
 - wherein the sheet shaped valve element is extended along the wall part to cover the aperture part by the rolling motion of the rolling element body in the closed direction and changed to a state in which the aperture part is opened from the extended state by the rolling motion of the rolling element body in the opened direction.
4. The flow control device according to claim 3, wherein the sheet shaped valve element extends along the wall part to cover the aperture part by the rolling

motion of the rolling element body in the closed direction from a state in which the sheet shaped valve element is wound around the rolling element body and to be wound around the rolling element body to open the aperture part by the rolling motion of the rolling element body in the opened direction from the extended state of the sheet shaped valve element.

5. The flow control device according to claim 3, wherein the aperture part is formed in a shape extended in a rolling direction of the rolling element body.

6. The flow control device according to claim 5, wherein the shape of the aperture part is formed so as to have different opening widths in the rolling direction of the rolling element body.

7. The flow control device according to claim 6, wherein the aperture part is formed having the aperture opening width is narrow on one side and wide on the other side.

8. The flow control device according to claim 3, wherein the wall part is a cylindrical wall part having an inner side formed downstream and the rolling element body performs a planet motion along an outer wall face of the cylindrical wall part.

9. The flow control device according to claim 8, further comprising a movable body provided in the valve element drive mechanism and rotates about the cylindrical wall part while rotatably supporting the rolling element body,

wherein the movable body is rotated about the cylindrical wall part moving

the rolling element body along the outer wall face of the cylindrical wall part.

10. The flow control device according to claim 9, wherein the movable body is a ring-shaped sprocket provided with internal teeth and the valve element drive mechanism is disposed in such that the internal teeth of the ring-shaped sprocket are engaged with a power transmission gear on the drive source side.

11. The flow control device according to claim 3, wherein a first set of outer teeth are formed in the rolling element body and a second set of outer teeth engaged with the first set of outer teeth for rotating the rolling element body are formed on the wall face side.

12. The flow control device according to claim 3, further comprising an urging member for urging the rolling element body toward the wall face.

13. The flow control device according to claim 1, further comprising a home position reset mechanism for returning the sheet shaped valve element toward a home position where the aperture part is completely opened or toward a home position where the aperture part completely closed when energization for a motor of the valve element drive mechanism stops,

wherein the valve element drive mechanism drives the sheet shaped valve element from the home position in a specified direction against a force which the home position reset mechanism exerts on the sheet shaped valve element.

14. The flow control device according to claim 13, wherein a gap between a field magnetic pole and a magnet of the motor is set to be not less than 0.2mm.

15. The flow control device according to claim 13, wherein a reduction gear ratio in the valve element drive mechanism is set to be not more than 1/10.

16. The flow control device according to claim 1, wherein the sheet shaped valve element is an elastic sheet.

17. The flow control device according to claim 1, wherein the fluid is gas or liquid.

18. A flow control device comprising:

a wall part partitioning an upstream side and a downstream side of a flow passage for fluid;

an aperture part formed on the wall part;

a sheet shaped valve element which changes from closed state in which the sheet shaped valve element extends along the wall part to cover the aperture part to an open state in which the aperture part is opened; and

means for moving the sheet shaped valve element.

19. The flow control device according to claim 18, wherein the means for moving the sheet shaped valve element adjusts an opening degree of the aperture part by the sheet shaped valve element.

20. A method for manufacturing a flow control device comprising:

partitioning an upstream side and a downstream side of a flow passage for fluid by a wall part;

forming an aperture part on the wall part;

providing a sheet shaped valve element which changes from a closed state in which the sheet shaped valve element extends along the wall part to cover the aperture part to an open state in which the aperture part is opened; and moving the sheet shaped valve element.